

Variable Conductance Heat Pipes for Radioisotope Stirling Systems, Phase II

Completed Technology Project (2007 - 2010)



Project Introduction

The overall technical objective of the proposed Phase II program is to complete a system-level demonstration to show the capability and benefits of integrating this backup radiator/Variable Conductance Heat Pipe (VCHP) with the Advanced Stirling Radioisotope Generator (ASRG). The Phase I project developed a feasible VCHP radiator design that can be integrated with the ASRG. In Phase II, a trade study will be conducted to optimize the VCHP design. A superalloy heat pipe will be fabricated from Haynes 230, which has good strength at the 850

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C operating temperature and long term life tests with alkali metals. In addition to the VCHP, a General Purpose Heat Source (GPHS) simulator and a Heater Head simulator will both be designed and fabricated. Testing of the VCHP with the GPHS and Heater Head simulators will verify the ability of the VCHP to provide backup cooling for the Stirling convertors. The goal at the end of the program would be to bring the concept to Technology Readiness Level 5: Component Validation in a Relevant Environment.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Advanced Cooling Technologies, Inc.	Supporting Organization	Industry	Lancaster, Pennsylvania

Primary U.S. Work Locations	
Ohio	Pennsylvania

Project Transitions

 **December 2007:** Project Start

 **December 2010:** Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.2 Heat Sources